

## CLAIMS

## I CLAIM:

1. A valve assembly, comprising:
  - a valve body having at least a fluid inlet, and a fluid outlet;
  - a valve element disposed at least partially within the valve body and moveable between (i) an open position, in which the valve body fluid inlet is in fluid communication with the valve body fluid outlet, and (ii) a closed position, in which the valve body fluid inlet is not in fluid communication with the valve body fluid outlet; and
  - an actuator assembly coupled to the valve element, the actuator assembly including:
    - a housing,
    - a torque source disposed within the housing, the torque source adapted to receive one or more position control signals and operable, in response thereto, to supply a drive force,
    - a position sensor disposed within the housing, the position sensor coupled to receive the drive force and operable, in response thereto, to supply a signal representative of valve position, and
    - an output shaft disposed at least partially within the housing and coupled to the valve element, the output shaft further coupled to receive the drive force from the torque source, to thereby selectively move the valve element, upon receipt of the drive force, between the open and closed positions.
2. The valve assembly of Claim 1, further comprising:
  - a gear train disposed within the actuator assembly housing and coupled between the torque source and the position sensor, whereby the drive force from the torque source is coupled to the position sensor.

3. The valve assembly of Claim 2, wherein the gear train is a step down gear train.

4. The valve assembly of Claim 1, further comprising:  
a connector assembly coupled to the housing and including a plurality of conductors electrically coupled to at least the torque source.

5. The valve assembly of Claim 4, wherein the connector assembly further includes a plurality of conductors electrically coupled to at least the position sensor.

6. The valve assembly of Claim 1, wherein the torque source comprises an electric motor.

7. The valve assembly of Claim 6, wherein the electric motor is a stepper motor.

8. The valve assembly of Claim 1, wherein the position sensor comprises a rotary variable differential transformer (RVDT).

9. The valve assembly of Claim 1, further comprising:  
a shaft bearing assembly disposed within the actuator housing and surrounding at least a portion of the output shaft .

10. The valve assembly of Claim 1, wherein the output shaft is coupled to the position sensor to thereby receive the drive force therefrom.

11. A valve actuator assembly configured to move a valve between an open and closed position, comprising:

an actuator housing;

a torque source disposed within the actuator housing, the torque source adapted to receive one or more position control signals and operable, in response thereto, to supply a drive force;

a position sensor disposed within the actuator housing, the position sensor coupled to receive the drive force and operable, in response thereto, to supply a signal representative of valve position;

an output shaft disposed at least partially within the actuator housing and coupled to receive the drive force from the torque source, to thereby selectively move the valve, upon receipt of the drive force, between the open and closed positions.

12. The actuator assembly of Claim 11, further comprising:

a gear train disposed within the actuator assembly housing and coupled between the torque source and the position sensor, whereby the drive force from the torque source is coupled to the position sensor.

13. The actuator assembly of Claim 12, wherein the gear train is a step down gear train.

14. The actuator assembly of Claim 11, further comprising:

a connector assembly coupled to the housing and including a plurality of conductors electrically coupled to at least the torque source.

15. The actuator assembly of Claim 14, wherein the connector assembly further includes a plurality of conductors electrically coupled to at least the position sensor.

16. The actuator assembly of Claim 11, wherein the torque source comprises an electric motor.

17. The actuator assembly of Claim 16 wherein the electric motor is a stepper motor.

18. The actuator assembly of Claim 11, wherein the position sensor comprises a rotary variable differential transformer (RVDT).

19. The actuator assembly of Claim 11, wherein the output shaft is coupled to the position sensor to thereby receive the drive force therefrom.

20. A valve assembly, comprising:
- a valve body having at least a fluid inlet, and a fluid outlet;
  - a valve element disposed at least partially within the valve body and moveable between (i) an open position, in which the valve body fluid inlet is in fluid communication with the valve body fluid outlet, and (ii) a closed position, in which the valve body fluid inlet is not in fluid communication with the valve body fluid outlet; and
  - an actuator assembly coupled to the valve element, the actuator assembly including:
    - a housing,
    - a motor disposed within the housing, the motor adapted to receive one or more position control signals and operable, in response thereto, to supply a drive force,
    - a gear train disposed within the actuator assembly housing, the gear train coupled to receive and transfer the drive force supplied from the motor,
    - a position sensor disposed within the housing, the position sensor coupled to receive the drive force transferred from the gear train and operable, in response thereto, to supply a signal representative of valve position, and
    - an output shaft disposed at least partially within the housing and coupled to the valve element, the output shaft further coupled to receive the drive force transferred from the gear train, to thereby selectively move the valve element, upon receipt of the drive force, between the open and closed positions.